

# PATENT SPECIFICATION

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(72) Inventor: HARRY PENTNEY

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## (54) PLASTIC DOUBLE EDGE RAZOR

(71) We, THE GILLETTE COMPANY, a corporation organised and existing under the laws of the State of Delaware, United States of America, of Prudential Tower Building, Boston, Massachusetts 02199 United States of America do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:-

This invention relates to safety razors of the type comprising a guard platform member and a cap member which are releasably interengageable to position a thin flexible razor blade therebetween.

In the well known and widely used three-piece razor, the cap member has a central threaded stud which passes through the blade and guard platform member and is received in a threaded hole at one end of a separate handle, to clamp the members securely together with the blade firmly sandwiched between them. High stress concentrations arise in the region of the screw threaded parts, and this has the effect of limiting the choice of materials in which the components of the razor may be manufactured.

The present invention provides a razor in which this disadvantage is removed. More specifically the invention provides a safety razor comprising an elongate guard platform member, an elongate cap member and a handle member mounted on the underside of the guard platform members for sliding movement into and out of a locking position, the cap member being provided on its under surface with projection means which extend through the guard platform member and are engageable by the handle in its locking position to clamp the two members and the handle together and to clamp a thin flexible blade between the said members, movement of the handle out of the locking position

releasing the projection means to permit displacement of the cap member and removal of a blade, and wherein the projection means have a substantial extent longitudinally of the said members to provide for distribution of the clamping forces.

The cap member may be completely separable from the guard platform member to expose the blade, or may be pivotally connected to the platform member so as to be movable between its operative clamping position and an open position, about a transverse axis.

Some presently preferred razors in accordance with the invention are described below, by way of example, with reference to the accompanying drawings, in which:-

Figures 1 and 2 are a bottom plan and section of the cap member of a razor;

Figures 3 and 4 are a top plan and end view of the guard platform member of the same razor;

Figure 5 is an end view of the razor;

Figures 6 and 7 are side views of the same razor with the handle in its release and locking positions respectively;

Figure 8 is a section view of the razor in Figure 6;

Figures 9 and 10 are a top plan and end view of the guard platform member of a second razor;

Figure 11 is a diagrammatic partial side view of the second razor, and

Figures 12, 13 and 14 are somewhat diagrammatic sectional elevations of a third form of razor.

The razor illustrated in Figures 1 to 8 consists of three components, conveniently all of injection moulded synthetic plastics material, an elongate cap member 1, an elongate guard platform member 2 and a handle 3, and is for use with a standard, double edged, thin, flexible razor blade 4.

The cap 1 has a concave inner surface with depending end walls 6 having short, longitud-

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inally directed return portions 7 and small pips 8 to assist in locating a blade 4 longitudinally. The cap also has a depending elongate rib 9, the free edge of which is formed with local thickenings or lateral projections 11. The rib locates in the central slot of the blade 4 as seen in Figure 1.

The guard platform member 2 has a central slot 12 to receive the rib 9 and is recessed at each end at 13 to accommodate the end walls 6 and return portions 7 of the cap. It has upstanding pips 14 to locate in corresponding recesses 16 in the cap and square bosses 17 to locate in the ends of the razor blade central slot.

On its underside, the member 2 has a pair of L-section rails 18 for co-operation with the handle member 3 and two end stops, one of which is shown at 19 in Figures 6 and 7.

The handle 3 has a bifurcated upper end portion, the parallel limbs of which each have two continuous outer flanges 21 which slide on the rails 18 and 'Z' and interrupted inner flanges 22 which cooperate with the lateral projections 11 of the cap rib 9, at 'Z'.

For convenience of assembly, the lower, inner edges of the rails 18 are chamfered at 18A, so that the parts can be snap fitted together by pressing the flanges 21 of the handle against the chamfers 18A, the limbs of the handle being deflected towards each other and then recovering resiliently as the flanges 21 pass the edges of the rails 18.

When the handle is in the release position shown in Figure 6, the projections 11 register with the interruptions in the flanges 22 shown in Figure 8 whereas in the locked position of Figure 7, the flanges 22 engage over the projections 11 to hold the cap clamped down over the member 2. The upper ends of the handle abut the underside of the member 2 at 'Y' and lateral guidance is provided at the abutting surfaces 'X'.

In use, a blade 4 is loaded on to the cap member 1 and located by the pips 8 and rib 9. The cap and blade are then offered up to the guard platform member and the rib 9 passes through the slot 12, the lateral projections 11 passing through the flanges 22. Some manual pressure is required to flex the blade, and when the cap is fully home, the handle 3 is moved (from right to left as viewed in Figure 6) into its locked position, and the razor is ready for use.

The blade may be positively clamped between the members 1 and 2, with some resilient deflection of the razor components, or if slight clearance is allowed, may be held in flexed condition without positive clamping, its own resilience holding it in arched condition for shaving. This is controlled by selection of the dimensions of the members 1 and 2 and the spacing of abutting surfaces Y and Z. Shaving forces tending to tilt the members 1 and 2 about a longitudinal axis are resisted

by reactions at surfaces X and Y.

Release of the cap to permit removal of the blade is, of course, effected by returning the handle to its release position of Figure 6.

The second form of razor illustrated in Figures 9 to 11 is generally similar to the first, but is distinguished by the guard platform member 2 being adapted for preliminary location and frictional retention of the blade 4 and by the cap member being pivotally connected to the guard platform member for movement between its release and locking positions.

The guard platform member 2 has at one end a pair of upstanding blade stops 23 of undercut form (as seen in the end view of Figure 10), so that the blade must be flexed to permit the shoulders 4A to pass between the upper ends of the stops 23, the blade then returning resiliently to its normal flat state adjacent the feet of the posts 23. The blade is located laterally and longitudinally by the square bosses 17.

As illustrated in Figure 11 the cap member 1 has an integral transverse pivot pin 26 located in bearing portions 27 formed in the member 2, so that the cap can pivot about a transverse axis, parallel with the plane of the blade 4. The cap is swung clear of the guard platform member to permit removal of a blade and insertion of a fresh one, and is then swung over the member 2, so that its rib passes through the blade and guard platform member can then be locked by movement of the handle 3, as in the first embodiment. Removal of a blade is facilitated by the provision of finger recesses at the ends of the guard platform member.

A further modified embodiment is illustrated in Figures 12, 13 and 14. This embodiment is generally similar to that of Figures 9 and 10, but incorporates a modified pivotal connection and an interlock to prevent the handle from being moved into its locking position, except when the cap member is in its operative, clamping position.

In this embodiment the pivotal connection is provided by an integral transverse pivot pin 26 formed in the guard member 2, and bearing portions 27 formed in the cap member 1 having re-entrant recesses for snap-fitting engagement over the pivot pin 26 which permit the cap member to be disengaged from the pin 26 by excess movement of the cap in the opening direction, i.e. anti-clockwise movement of the cap beyond the fully open position shown in Figure 12. This protects the part against damage by such excess movement.

The above mentioned interlock is provided by forming the handle 3 with an integral cantilever spring 30 which lies in the path of the rib 9. In the fully open position of the parts shown in Figure 12, the left hand end of the spring abuts a stop 31 formed on

the undersurface of the member 2 to prevent movement of the handle to its locking position relative to the guard platform member 2. When the cap is swung over to its closed position, as shown in Figure 13, the spring is deflected, so as to clear the stop 31, thus permitting movement of the handle to the locking position shown in Figure 14.

The outer surface of the stop 31 is formed as a ramp to permit return of the handle to the release position without hindrance.

This interlock serves to ensure proper closing of the cap member before the user can move the handle into its locking position.

Such an interlock can, of course, also be provided on a razor in accordance with Figures 1 to 8.

In each of the above described embodiments, it will be seen that blade clamping forces are distributed longitudinally of the razor. While a continuous rib 9 is preferably employed, this could be replaced by separate pin-like projections to permit the razor to be used with blades of the type having three holes rather than a central slot.

By virtue of the distribution of clamping forces, the razors lend themselves well to manufacture in plastics components or if desired to part plastics part metal construction. For example the cap could be of metal and the other two components of plastics mouldings.

Additionally, the razors offer a higher degree of convenience to users than traditional three piece razors by virtue of their quick release and locking operation, compared with the somewhat inconvenient screw threaded connection of conventional razors. There is also some advantage in reducing the number of separate components. The second and third embodiments are particularly convenient in this respect since the three major components can remain coupled together throughout their working life if desired. On the other hand, the parts can be sprung apart at will to permit occasional thorough cleaning.

#### WHAT WE CLAIM IS:-

1. A safety razor comprising an elongate guard platform member, an elongate cap member and a handle member mounted on the underside of the guard platform member for sliding movement into and out of a locking position, the cap member being provided on its under surface with projection means which extend through the guard platform member and are engageable by the handle in its locking position to clamp the two members and the handle together and to clamp a thin flexible blade between the said members, movement of the handle out of the locking position releasing the projection means to permit displacement of the cap member and removal of a blade, and wherein the projection means have a substantial extent

longitudinally of the said members to provide for distribution of the clamping forces.

2. A safety razor according to claim 1 in which the projection means comprise separate projections spaced apart longitudinally of the cap member.

3. A safety razor according to claim 1 wherein the projection means comprises an elongate rib depending from the cap member and having at its lower edge outwardly directed flanges to which clamping forces are applied.

4. A safety razor according to claim 1, 2 or 3 wherein at least the guard platform and handle members are formed as mouldings of synthetic resin plastics material.

5. A safety razor according to any preceding claim, wherein the guard platform member is provided with upstanding means for locating a razor blade on the platform member.

6. A safety razor according to claim 5, wherein the upstanding means includes a pair of blade stops of undercut form so dimensioned and laterally spaced apart that a blade must be flexed to permit its passage between the upper ends of the posts and can then return to its normal, flat form adjacent the feet of the posts.

7. A safety razor according to claim any preceding claim wherein the upper end of the handle and the undersurface of the guard platform member have co-operating guide rails and flanges to constrain the members for linear sliding movement relative to each other.

8. A safety razor according to and preceding claim, wherein the cap member is completely separable from the guard platform member and must be separated therefrom to permit removal or replacement of a razor blade.

9. A safety razor according to any one of claims 1 to 7 wherein the cap member is pivotally connected to one end of the guard platform member for movement about a transverse axis between an open position in which a blade can be inserted in or removed from the razor, and a closed position in which a blade is clamped by the cap member against the guard platform member.

10. A safety razor according to claim 9 wherein the pivotal connection between the cap member and the guard platform member permits snap-fitting interengagement and disengagement of the parts when the cap member is in an open position.

11. A safety razor according to any preceding claims including interlock means acting between the handle and the guard platform member to prevent movement of the handle into its locking position, relative to the guard platform member, except when the cap member is in its clamping position relative to the guard platform member.

12. A safety razor according to claim 11 wherein the handle has a resilient portion for engagement with a stop fast with the guard platform member, the resilient portion being  
5 disposed in the path of the projection means so as to be displaced thereby, clear of the stop, when the cap member moves into its clamping position.

13. A safety razor substantially as herein described with reference to Figures 1 to 8 of the accompanying drawings.

14. A safety razor substantially as herein described with reference to Figures 9 to 11 of the accompanying drawings.

15. A safety razor substantially as herein described with reference to Figures 12 to 14 of the accompanying drawings.

20 A.A. THORNTON & CO.  
Chartered Patent Agents,  
Northumberland House,  
303-306, High Holborn,  
London, WC1V 7LE  
Agents for the Applicants

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3 SHEETS

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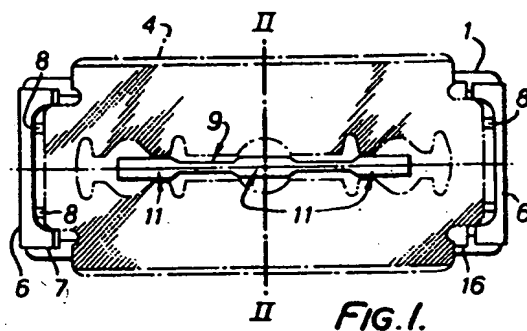


FIG. 1.

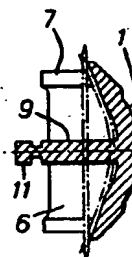


FIG. 2.

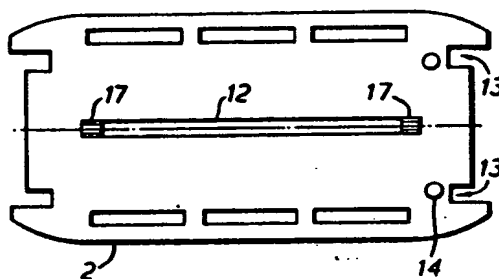


FIG. 3.

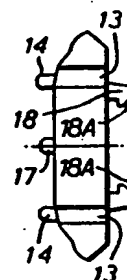


FIG. 4.

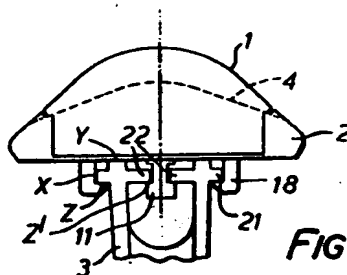


FIG. 5.

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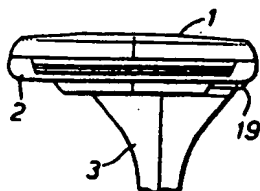


FIG. 6.

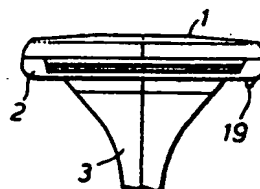


FIG. 7.

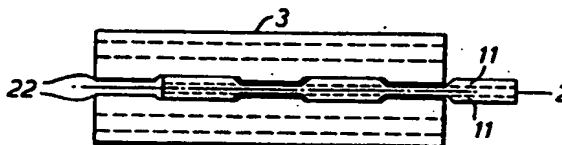


FIG. 8.

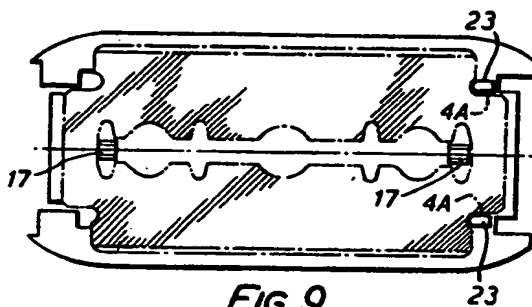


FIG. 9.

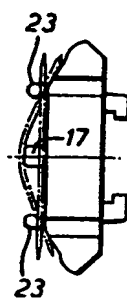


FIG. 10.

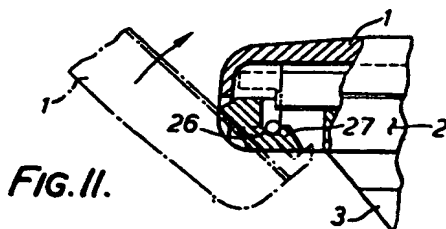


FIG. 11.

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Sheet 3

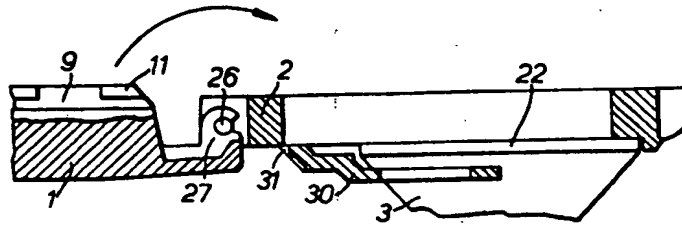


FIG. 12.

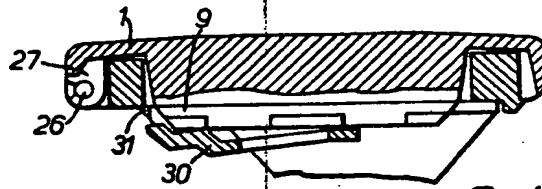


FIG. 13.

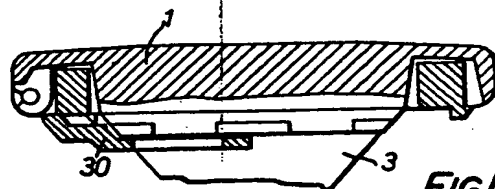


FIG. 14.

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